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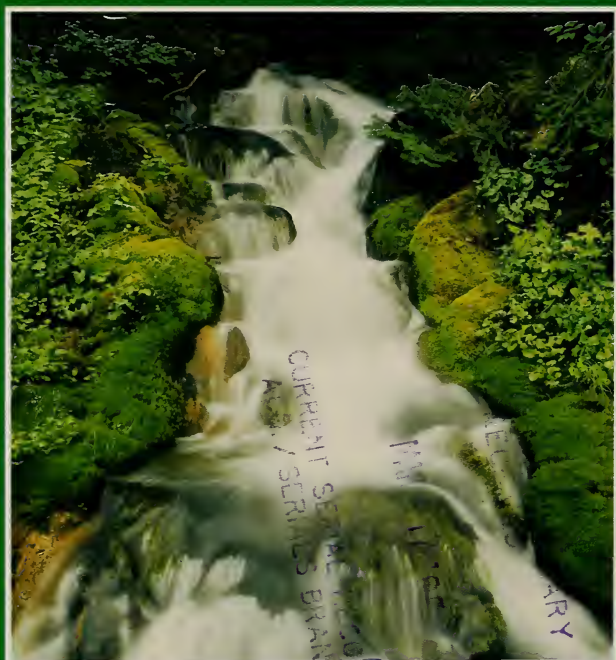
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FOREST SERVICE

GLOBAL CHANGE RESEARCH PROGRAM

An Introduction



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Forest Service







Global change may result in increased incidence of forest fires and insect and disease outbreaks.

Human society—indeed, human survival itself—depends on natural resources. It is this fact that makes global change so urgent a topic. Global change matters, not because it is an interesting scientific phenomenon but because it would dramatically affect most of our natural resources.

We count on forests to satisfy many of our basic human needs. They provide lumber for homes and a refuge from the noise and pollution of cities. Standing forests create shade that reduces local temperatures and helps conserve moisture. Their leaves, branches, and roots cushion the fall of raindrops and filter impurities from our air and water and produce oxygen. Forests also extract carbon dioxide—the major factor in global warming—from the atmosphere.

As the global environment goes, so go forests. Earth's climate and atmospheric chemistry have changed on many occasions in the past, and research shows that forests have expanded or died back in direct response. The global environment will change again, whether as a result of human actions or more powerful natural forces. When it does, forests will again “migrate” or perish.



Forest ecosystems thrive only where natural and human influences permit.

As the steward of over 191 million acres of national forests and grassland, the USDA Forest Service is vitally interested in the potential for change in the relationship between forests and the environment. The Forest Service Global Change Research Program (FSGCRP) is committed to producing scientific information for natural resource managers and policy makers. In order to provide a foundation for forestry practices that will enhance the health of forests for hundreds of years, the FSGCRP is trying to find answers to three fundamental questions:

Is there a global change problem?

To answer this, we need to know what processes in forested ecosystems are sensitive to physical and chemical changes in the atmosphere.

How serious is the problem?

This depends on how future physical and chemical climate changes will influence the structure, function, and productivity of forests and related ecosystems and to what extent forest ecosystems will change in response to atmospheric changes.



Forest management practices could offset some of the impacts of global change.

What can be done about the problem?

We need to determine what its implications for forest management are and how forest management activities must be altered to sustain forest productivity, health, and diversity in a changing global environment.

Examples of FSGCRP research:

Cooperative research studies in the Snowy Range of southeast Wyoming provide information on the effects of atmospheric change on water, plants, and native fish species in the region. Models will help natural resource managers plan for the effect of environmental change on sensitive wilderness areas.

Studies of the response of trees to air pollution and environmental stresses such as drought will lead to an understanding of the conditions necessary for tree species to thrive. Coupled with climate models, this information will permit managers to choose the appropriate trees for future environments. Cooperation with scientists



Changes in atmospheric chemistry have already affected the health of forest ecosystems.

in Brazil, Canada, Australia, Russia, and other European countries is yielding detailed information on smoke from forest burning and its contribution to global change. This work is leading to public education programs on burning practices that are less damaging to human health and the environment.

U.S. forests and tree planting programs have been touted as a way to offset emissions of carbon dioxide to the atmosphere. Forest service scientists are working with others to estimate the amount of carbon stored in forests and wood products and to project future carbon storage trends.

Economists, plant physiologists, and climatologists are using models to project future forest inventories for the Southern United States. This information will be used to calculate changes in the economic welfare of timber producers and consumers.

Researchers in Chicago are studying how trees affect city environments. Their findings will help urban forestry programs enhance environmental



Fragile ecosystems may be disturbed by global change.

quality, energy efficiency, and civic beauty across the United States.

If you'd like more information on this subject, please write or phone:

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